IS 12337 (1988): Manually Operated Fertilizer Broadcaster
[FAD 21: Farm Implements and Machinery]

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AMENDMENT NO. 1 AUGUST 1996
TO
IS 12337 : 1988 SPECIFICATION FOR MANUALLY OPERATED FERTILIZER BROADCASTER

(*Page* 2, *clause* 3.1) — Substitute the following for the existing text:

'3.1 The materials for construction of various components of manually operated fertilizer broadcasters are given in Table 1 for guidance.'

(*Page* 2, *Table* 1) — Substitute the following for the existing table:

Table 1 Material for Construction of Different Components

Sl No.	Component	Material	Applicable Indian Standard
(1)	(2)	(3)	(4)
i)	Hopper	Mild steel	2062 : 1992*
		Galvanized steel sheet	277 : 1992†
		Aluminium	617 : 1975‡
		Fibre glass reinforced plastics	—
		Plastics	—
ii)	Spreading disc	do	—
iii)	Lid	do	—
iv)	Handle Grip	Seasoned wood	620 : 1975§
		Plastics	—
v)	Gears	Mild steel	2062 : 1992*
		Nylon	—
vi)	Agitators	Mild steel	2062 : 1992*
		Spring steel	4454 (Part 2) : 1975‖
vii)	Gear shaft	Mild steel	2062 : 1992*
		Carbon steel	5517 : 1993¶
viii)	Centre shaft	do	do
ix)	Crank shaft	Mild steel	2062 : 1992*
x)	Feed control	do	2062 : 1992*
	mechanism	Galvanized steel sheet	277 : 1992†
		Nylon	—
xi)	Strap	Woven web cotton	—
		Synthetic yarn	—

*Steel for general structural purposes — Specification (*fourth revision*).

†Specification for steel sheets, galvanized (plain and corrugated) (*fifth revision*).

‡Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

§General requirements for wooden tool handles (*third revision*).

‖Specification for steel wires for cold formed springs: Part 2 Oil hardened and tempered spring steel wire and valve spring wire-unalloyed (*first revision*).

¶Specification for steels for hardening and tempering (*second revision*).

Amend No. 1 to IS 12337 : 1988

(*Page* 3, *clause* **8.1**, *line* 2) — Substitute 'IS 7201 (Part 1) : 1987 'Method of sampling of agricultural machinery and equipment : Part 1 : Handtools and hand operated/animal drawn equipment (*first revision*)' *for* 'IS 7201 : 1974 'Method of sampling of agricultural machinery and tractors'.

(FAD 59)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR MANUALLY OPERATED FERTILIZER BROADCASTER

Showing, Fertilizer and Manure Application Equipment Sectional Committee, AFDC 59 [Ref: Doc: AFDC 59 (2823)]

1. Scope – This standard prescribes the material, constructional and other requirements of manually operated fertilizer broadcaster.

2. Terminology — For the purpose of this standard, the following definitions shall apply (*see also* Fig. 1).

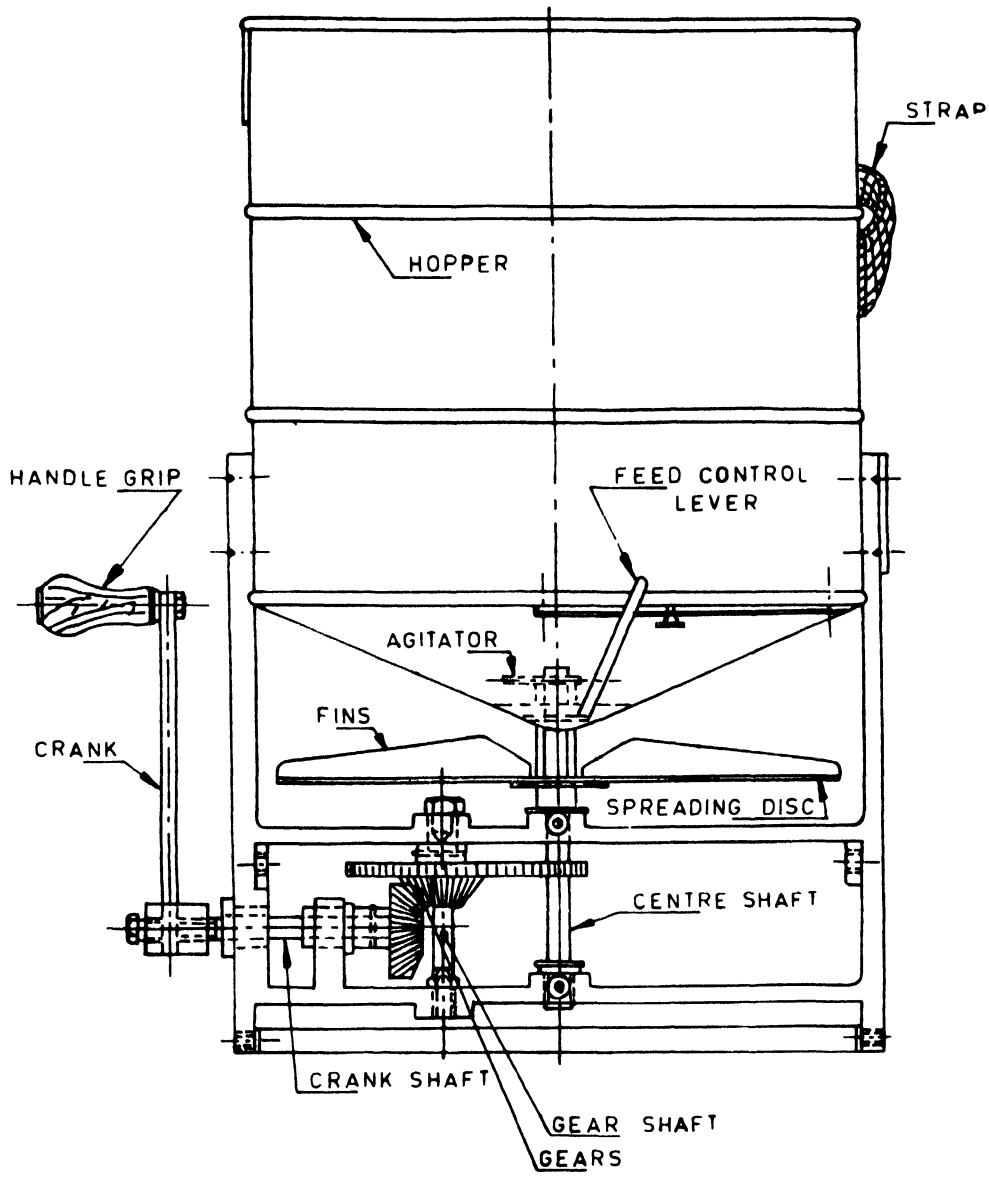

FIG. 1 NOMENCLATURE OF A MANUALLY OPERATED FERTILIZER BROADCASTER

2.1 *Agitator* — A device which mechanically initiates the movement of the fertilizer within the hopper (*see* **2.6**).

2.2 *Broadcasting* — The process of scattering of agricultural inputs, such as seed, fertilizer and manure on the surface of the soil.

2.3 *Crank* — A component to help in rotating the gear train.

2.4 *Feed Control* — A device to control the feed of the fertilizer.

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2.5 *Fertilizer Broadcaster* — A fertilizer distributor with a spreading width substantially greater than the width of the machine.

2.6 *Hopper* — A container for holding the fertilizer.

2.7 *Spreading Disc* — A circular disc having equally spaced fins for spreading the material falling on the disc by centrifugal force.

2.8 *Total Mass* — The mass of the broadcaster with all its mountings and attachments but without any fertilizer in the hopper.

3. Material

3.1 The material for the construction of different components of the broadcaster shall be selected from those given in col 3 of Table 1. The material shall conform to the Indian Standards given in col 4 of Table 1.

TABLE 1 MATERIAL FOR CONSTRUCTION OF DIFFERENT COMPONENTS

Sl No.	Name of Component	Material	Applicable Standard
(1)	(2)	(3)	(4)
i)	Hopper	Mild steel	IS : 226-1975*
		Galvanized steel sheet	IS : 277-1977†
		Aluminium	IS : 617-1975‡
		Fibre glass reinforced plastics	—
		Plastics	—
ii)	Spreading disc		
iii)	Lid		
iv)	Handle grip	Seasoned wood	IS : 620-1975§
		Plastics	—
v)	Gears	Mild steel	IS : 226-1975*
		Nylon	—
vi)	Agitators	Mild steel	IS : 226-1975*
		Spring steel	IS : 4454 (Part 2)-1975 ‖
vii)	Gear shaft }	Mild steel	IS : 226-1975*
viii)	Centre shaft }	Carbon steel	IS : 5517-1978¶
ix)	Crank shaft	Mild steel	IS : 226-1975*
x)	Feed control mechanism	Mild steel	IS : 226-1975*
		Galvanized steel sheet	IS : 277-1977†
		Nylon	—
xi)	Strap	Woven web cotton	—
		Synthetic yarn	—

*Specification for structural steel (standard quality) (*fifth revision*).

†Specification for steel sheets, galvanized (plain and corrugated) (*third revision*).

‡Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

§General requirements for wooden tool handles (*third revision*).

‖ Specification for steel wires for cold formed springs: Part 2 Oil hardened and tempered spring steel wire and valve spring wire-unalloyed (*first revision*).

¶Specification for steels for hardening and tempering (*first revision*).

3.2 The material used for different components shall be declared by the manufacturer in the parts catalogue (*see* 4.10).

4. Constructional Requirements

4.1 *Hopper* — The hopper shall have a concave shaped or conical bottom with a slope of 30 to 50° so that thefertilizer contained in it easily moves towards the feeding aperture. The hopper bottom shall have a circular hole for metering the fertilizer. The ratio between the diameter and the height of the hopper shall be in the range of 0·8 to 1·25. The hopper should be covered with a lid. The lid, if provided, should have a peeping hole of at least 75 mm in diameter or in minor axis, if oval, for observing the quantity of fertilizer left in the hopper during operation. The hopper should be sufficiently strong and should not buckle when fully filled with fertilizer.

4.1.1 The thickness of the mild steel and galvanized steel sheet for hopper shall be not less than 0·63 and 0·56 mm respectively.

4.2 *Spreading Disc* — The spreading disc mounted at the bottom of the hopper shall have 6 or 8 equally spaced fins. The spreading disc shall have a vertical clearance of at least 30 mm from the hopper bottom.

4.3 *Feed Control Mechanism* — A suitable feed control mechanism with locking device shall be provided to control the flow of fertilizer through the aperture. The mechanism shall be controlled by a lever from outside of the hopper and shall not require any tool for the operation. Provision

of an index pointer with marking for the aperture opening of hopper at positions closed, 1/4, 1/2, 3/4 and full shall be provided. Provision of a scale indicating the discharge rate in kg/ha at different settings of the aperture opening should be preferred.

4.4 *Agitator* — A suitable agitator shall be provided near the orifice of the hopper to avoid the clogging of the aperture and for feeding the fertilizer to the aperture. The agitator shall be kept at a vertical clearance of at least 3 mm above the aperture.

4.5 *Gear Box and Gears* — A suitable gear arrangement shall be provided for giving a peripheral speed of 500 ± 50 cm/s to the spreading disc. The gear box shall be so designed as to allow easy access to gears for lubricating and inspection. Suitable provision for lubrication shall be provided. The gears shall mate correctly and shall move smoothly.

4.6 *Crank* — A crank shall be fitted with the crank shaft which should function in a clockwise motion. The crank shall be fitted with a handle of sufficient size. The handle shall be in easy reach of the operator.

4.7 *Straps* — Two straps of suitable length shall be provided in order to help easy carriage of the broadcaster. The provision for easy adjustment of the length of the straps shall be provided. At the option of the purchaser, a cushion of minimum 40 mm width and 20 mm thickness shall be provided with the straps at least on that portion which rests on the shoulder of the operator. The cushion, if provided, shall be covered with cotton, canvas, rexin, PVC or plastic coated fabrics.

4.7.1 The straps and their assembly shall withstand the test prescribed in **A-1**.

4.8 *Bearings* — The crank shaft, gear shaft and the centre shaft shall be provided with bearings. The bearings shall be dust proof.

4.9 *Total Mass* — The total mass of the broadcaster shall not exceed 5 kg (*see* **2.8**).

4.10 Operational and maintenance manual and parts catalogue shall be provided with each broadcaster. The manual should also contain the safety precautions, recommended forward speed, handle speed, effective width of spread, calibration chart indicating the discharge rate in kg/ha at different settings of the aperture opening, etc.

4.10.1 Each broadcaster shall also be supplied with necessary tools.

5. **Capacity** — The total capacity of the hopper shall be 12 to 15 litres. The capacity shall be declared by the manufacturer. The tolerance on the declared capacity shall be ±5 percent.

6. Workmanship and Finish

6.1 The components of the broadcaster shall have a smooth finish and shall be free from pits, burrs, sharp edges and other defects that may be deterimental for their use.

6.2 The exposed metallic parts shall have a protective coating to prevent surface deterioration in transit and storage.

7. Marking and Packing

7.1 *Marking* — Each broadcaster shall be marked with the following particulars:

a) Manufacturer's name or recognized trade-mark, if any;

b) Batch or code number; and

c) Hopper capacity.

7.1.1 *Standard Marking* — Details available with the Bureau of Indian Standards.

7.2 *Packing* — Each broadcaster shall be packed, as agreed to between the purchaser and the supplier, for safe handling in transit.

8. Sampling for Lot Acceptance

8.1 Unless otherwise agreed to between the purchaser and the supplier, sampling of the broadcaster for lot acceptance shall be done in accordance with 3 of IS : 7201-1974 'Method of sampling of agricultural machinery and tractors'. The classification of different requirements of this specification for the purpose of lot acceptance is given below for guidance:

a) Dimensional and visual requirements — *See* **4** (except **4.7.1** and **4.9**) and **6**.

b) Other than visual and dimensional requirements — *See* **4.7.1**, **4.9** and **5**.

APPENDIX A

(*Clause* 4.7.1)

A-1. Strap Drop Test

A-1.1 The hopper shall be filled with granular fertilizer to its total capacity. The broadcaster shall be hung from a solid support by its straps, simulating its carriage by the operator. It shall be lifted to a height of 30 cm and allowed to drop and hang by straps 25 times. The straps and their assembly shall be deemed to have passed this test, if no breakage, deformation, etc, are found during the test.

EXPLANATORY NOTE

Fertilizers are broadcast in the field mostly by hand. But hand broadcasting is time consuming and also the distribution is non-uniform. To overcome these, simple hand operated fertilizer broadcasters have been developed and are being produced and used in the country. This standard is, therefore, being issued to guide the manufacturers to produce quality equipments and the users to help in selection of broadcasters.

This standard has been prepared taking into considerations the manufacturing practices prevailing in the country. In the preparation of this standard, assistance has been obtained from Punjab Agricultural University, Ludhiana.

The figure given in the standard is meant only for illustration of components. This should not be considered as suggestive of any standard design.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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